SUBSECTION 8.12

Hazardous Materials Handling

8.12 Hazardous Materials Handling

8.12.1 Introduction

This subsection evaluates the potential effects on human health and the environment from the storage and use of hazardous materials in conjunction with the proposed San Francisco Electric Reliability Project (SFERP). Subsection 8.12.2 presents the laws, ordinances, regulations, and standards (LORS) applicable to hazardous materials; Subsection 8.12.3 describes the existing environment that may be affected, and Subsection 8.12.4 identifies potential impacts on the environment and on human health from site development. Subsection 8.12.5 discusses the offsite migration modeling. Subsection 8.12.6 discusses fire and explosion risk. Subsection 8.12.7 addresses potential cumulative impacts, Subsection 8.12.8 presents proposed mitigation measures, and Subsection 8.12.9 describes the agencies involved and provides agency contacts. Subsection 8.12.10 describes permits required and the permit schedule. Subsection 8.12.11 provides the references used to develop this section. Hazardous waste management, including handling of potentially contaminated soil and groundwater, is addressed in Subsection 8.13, Waste Management.

Most of the hazardous materials that will be used for the project are required for treatment and laboratory analysis of the cooling water, facility maintenance, wastewater treatment, and lubrication of equipment or will be contained within transformers and electrical switches. The project will comply with applicable laws and regulations for the storage of these materials to minimize the potential for a release of hazardous materials and will conduct emergency response planning to address public health concerns regarding hazardous materials storage.

Onsite storage of aqueous ammonia, required for the control of oxides of nitrogen emissions, presents the greatest potential public health risk due to the chemical properties of ammonia. However, the project includes specific design features (described in Subsection 8.12.4.2), that will control the extent of a gaseous release in the event of a catastrophic spill of ammonia. In addition, an offsite consequence analysis conducted for the project indicates that in the unlikely event of a catastrophic release, gaseous ammonia concentrations would not exceed 5 parts per million (ppm) beyond the property boundary to the north, south, or east. The 5 ppm level is well below the California Energy Commission's [CEC's] significance level of 75ppm, and constitutes the odor threshold for ammonia. To the west, gaseous ammonia concentrations would exceed 2000 ppm, approximately 35 feet onto the proposed MUNI Maintenance and Operations Center which is not accessible to the public. The portion of the MUNI Maintenance Operations Center to be impacted will be a railcar storage yard. Since the ammonia plume would not extend into a publicly accessible area, the storage of ammonia at the proposed project site will not present an unacceptable public health risk. The project will install ammonia sensors to activate audible alarms and flashing lights to alert MUNI and SFERP personnel that a spill has occurred. The Applicant will also work with the proposed MUNI Maintenance and Operations Center to determine other appropriate means to notify MUNI employees should there be a release and proper response in the event of a spill, including notification of hazardous response team(s). (See also the offsite consequence analysis in Subsection 8.12-5.)

The Applicant will prepare and maintain a risk management plan (RMP), described in Subsection 8.12.8.2.2, addressing the potential effects of an accidental release, a program for preventing a release, and emergency response procedures in the event of a release. The plan will be submitted to the San Francisco Department of Public Health and distributed to other agencies including the San Francisco Fire Department, which will be responsible for assisting plant personnel in the event of a chemical emergency. Preparation and implementation of the RMP will further reduce the public health risks associated with the storage of ammonia at the SFERP.

8.12.2 Laws, Ordinances, Regulations, and Standards

The storage and use of hazardous materials and regulated substances at the facility are governed by federal, state, and local laws. Applicable laws and regulations address the use and storage of hazardous materials to protect the environment from contamination, and to protect facility workers and the surrounding community from exposure to hazardous and regulated substances. The applicable LORS are summarized in Table 8.12-1 and described below.

TABLE 8.12-1
Applicable Laws, Ordinances, Regulations, and Standards

LORS	Applicability	Conformance (Section No.)
Federal		
CERCLA/SARA/EPCRA		
Section 302, EPCRA (Pub. L. 99–499, 42 USC 11022) Hazardous Chemical Reporting: Community Right-To-Know (40 CFR 370)	Requires one time notification if extremely hazardous substances are stored in excess of TPQs. The facility will have ammonia in concentrations greater than 20 percent and in excess of the threshold quantity of 20,000 pounds.	An HMBP and an RMP will be prepared for submittal to the San Francisco Department of Public Health (Subsection 8.12.8.2.2).
Section 304, EPCRA (Pub. L. 99–499, 42 USC 11002) Emergency Planning And Notification (40 CFR 355)	Requires notification when there is a release of hazardous material in excess of its RQ.	An HMBP will be prepared to describe notification and reporting procedures (Subsection 8.12.8.2.1).
Section 311, EPCRA (Pub. L. 99–499, 42 USC 11021) Hazardous Chemical Reporting: Community Right-To-Know (40 CFR 370)	Requires that either material safety data sheets (MSDSs) for all hazardous materials or a list of all hazardous materials be submitted to the SERC, LEPC, and local fire department.	The HMBP to be prepared will include a list of hazardous materials for submission to agencies (Subsection 8.12.8.2.1).
Section 313, EPCRA (Pub. L. 99–499, 42 USC 11023) Toxic Chemical Release Reporting: Community Right-To-Know (40 CFR 372)	Requires annual reporting of releases of hazardous materials.	The HMBP to be prepared will describe reporting procedures (Subsection 8.12.8.2.1).

TABLE 8.12-1
Applicable Laws, Ordinances, Regulations, and Standards

LORS	Applicability	Conformance (Section No.)
Section 112, Clean Air Act Amendments (Pub. L. 101–549, 42 USC 7412) Chemical Accident Prevention Provisions (40 CFR 68)	Requires facilities that store a listed hazardous material at a quantity greater than the TQ to develop a Risk Management Plan. The facility will have ammonia in concentrations greater than 20 percent and in excess of the threshold quantity of 20,000 pounds.	An RMP will be prepared for submittal to the San Francisco Department of Public Health (Subsection 8.12.8.2.2).
Section 311, Clean Water Act (Pub. L. 92–500, 33 USC 1251 et seq.) Oil Pollution Prevention (40 CFR 112)	Requires preparation of an SPCC plan if oil is stored in a single aboveground storage tank with a capacity greater than 660 gallons or if the total petroleum storage (including ASTs, oil-filled equipment, and drums) is greater than 1,320 gallons. The facility will have petroleum in excess of the aggregate volume of 1,320 gallons.	An SPCC will be prepared (Subsection 8.12.8.2.3).
Pipeline Safety Laws (49 USC 60101 et seq.) Hazardous Materials Transportation Laws (49 USC 5101 et seq.) Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards (49 CFR 192)	Specifies natural gas pipeline construction, safety, and transportation requirements.	The natural gas pipeline will be constructed in accordance with 49 CFR requirements (Subsection 8.12.6).
California		
Health and Safety Code, Section 25500, et seq. (HMBP)	Requires preparation of an HMBP if hazardous materials are handled or stored in excess of threshold quantities.	An HMBP will be prepared for submittal to the San Francisco Department of Public Health (Subsection 8.12.6.2).
Health and Safety Code, Section 25531 through 25543.4 (CalARP)	Requires registration with local CUPA or lead agency and preparation of an RMP if regulated substances are handled or stored in excess of TPQs.	An RMP will be prepared for submittal to the San Francisco Department of Public Health (Subsection 8.12.6.2).
Health and Safety Code, Section 25270 through 25270.13 (Aboveground Petroleum Storage Act)	Requires preparation of an SPCC plan if oil is stored in a single aboveground storage tank with a capacity greater than 660 gallons or if the total petroleum storage (including ASTs, oil-filled equipment, and drums) is greater than 1,320 gallons. The facility will have petroleum in excess of the aggregate volume of 1,320 gallons.	An SPCC plan will be prepared (Subsection 8.12.6.2.3).
Health and Safety Code, Section 25249.5 through 25249.13 (Safe Drinking Water and Toxics Enforcement Act) (Proposition 65)	Requires warning to persons exposed to a list of carcinogenic and reproductive toxins and protection of drinking water from same toxins.	The site will be appropriately labeled for chemicals on the Proposition 65 list. (Subsection 8.12.2.4)

TABLE 8.12-1
Applicable Laws, Ordinances, Regulations, and Standards

LORS	Applicability	Conformance (Section No.)
California Public Utilities Commission (CPUC) General Order Nos. 112-E and 58-A	Specify standards for gas service and construction of gas gathering, transmission, and distribution piping systems.	Construction of the natural gas pipeline will comply with the standards specified in these General Orders (Subsection 8.12.6).
Local		
San Francisco Public Health Code, Article 21	Requires preparation of a Hazardous Materials Certificate of Registration and Hazardous Materials Business Plan for storage of hazardous materials.	A Hazardous Materials Certificate of Registration and HMBP will be prepared for submittal to the San Francisco Department of Public Health (Subsection 8.12.8.2.1).
San Francisco Public Health Code, Article 21A	Requires preparation of a Risk Management Plan for regulated substances.	An RMP will be prepared for submittal to the San Francisco Department of Public Health. RMP will be prepared using the San Francisco Department of Public Health's Regulated Substance Program Guidance Document for Preparation of a RMP (Subsection 8.12.8.2.2).
San Francisco Fire Code	Requires proper storage and handling of hazardous materials.	San Francisco Fire Code will be followed for design and construction of the hazardous materials handling facilities (Subsection 8.12.8.2.1).

Notes:

Cal ARP	California Accidental Release Program
CAA	Clean Air Act [Amendments]
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
CWA	Clean Water Act
CUPA	Certified Unified Program Agency
EHS	extremely hazardous substance
EPCRA	Emergency Planning and Community Right-to-Know Act
HMBP	Hazardous Materials Business Plan
LEPC	local emergency planning committee
MSDS	Material Safety Data Sheet
Pub. L.	Public Law
RMP	Risk Management Plan
RQ	Reportable Quantity
SARA	Superfund Amendments and Reauthorization Act
SERC	state emergency response commission
SPCC	Spill Prevention Control and Countermeasure Plan
TPQ	Threshold Planning Quantity
TQ	Threshold Quantity
USC	United States Code

8.12.2.1 Federal

Hazardous materials are governed under the Comprehensive Environmental Response and Liability Act (CERCLA), the Clean Air Act (CAA), and the Clean Water Act (CWA).

8.12.2.1.1 CERCLA. The Superfund Amendments and Reauthorization Act (SARA) amends CERCLA and governs hazardous substances. The applicable part of SARA for the proposed project is Title III, otherwise known as the Emergency Planning and Community

Right-To-Know Act of 1986 (EPCRA). Title III requires states to establish a process for developing local chemical emergency preparedness programs and to receive and disseminate information on hazardous substances present at facilities in local communities. The law provides primarily for planning, reporting, and notification concerning hazardous substances. Key sections of the law are:

- Section 302—Requires one time notification when extremely hazardous substances (EHSs) are present in excess of their threshold planning quantities (TPQs). EHSs and their TPQs are found in Appendices A and B to 40 Code of Federal Regulations (CFR) Part 355.
- Section 304—Requires immediate notification to the local emergency planning committee (LEPC) and the state emergency response commission (SERC) when a hazardous material is released in excess of its reportable quantity (RQ). If a CERCLA-listed hazardous substance RQ is released, notification must also be given to the National Response Center in Washington, D.C. (RQs are listed in 40 CFR Part 302, Table 302.4). These notifications are in addition to notifications given to the local emergency response team or fire personnel.
- Section 311—Requires that either material safety data sheets (MSDSs) for all hazardous materials or a list of all hazardous materials be submitted to the SERC, LEPC, and local fire department.
- Section 313—Requires annual reporting of hazardous materials released into the environment either routinely or as a result of an accident.

8.12.2.1.2 Clean Air Act. Regulations (40 CFR 68) under the CAA are designed to prevent accidental releases of hazardous materials. The regulations require facilities that store a Threshold Quantity (TQ) or greater of listed regulated substances to develop a Risk Management Plan (RMP), including hazard assessments and response programs to prevent accidental releases of listed chemicals. Section 112(r)(5) of the CAA discusses the regulated substances. These substances are listed in 40 CFR 68.130. Aqueous ammonia is a listed substance and its TQ for solutions of 20 percent and greater is 20,000 pounds of solution.

8.12.2.1.3 Clean Water Act. The Spill Prevention, Control, and Countermeasures (SPCC) program under the CWA is designed to prevent or contain the discharge or threat of discharge of oil into navigable waters or adjoining shorelines. Regulations (40 CFR 112) under the CWA require facilities to prepare a written SPCC Plan if they store oil and its release would pose a threat to navigable waters. The SPCC program is applicable if a facility has a single oil aboveground storage tank (AST) with a capacity greater than 660 gallons, total petroleum storage (including ASTs, oil-filled equipment and drums) greater than 1,320 gallons, or underground storage capacity greater than 42,000 gallons.

Other related federal laws that address hazardous materials but do not specifically address their handling, are the Resource Conservation and Recovery Act (RCRA), which is discussed in Section 8.13, Waste Management, and the Occupational Safety and Health Act, which is discussed in Section 8.7, Worker Health and Safety.

8.12.2.1.4 Natural Gas Pipeline Construction and Safety. Title 40 of the Code of Federal Regulations, parts 190 through 192, specifies safety and construction requirements for natural gas pipelines. Part 190 outlines pipeline safety procedures, Part 191 requires a

written report for any reportable incident, and Part 192 specifies minimum safety requirements for pipelines.

8.12.2.2 State

California laws and regulations relevant to hazardous materials handling at the facility include Health and Safety Code Section 25500 (hazardous materials), Health and Safety Code 25531 (regulated substances), and the Aboveground Petroleum Storage Act (petroleum in aboveground tanks).

8.12.2.2.1 Health and Safety Code Section 25500. California Health and Safety Code, Section 25500, et seq., and the related regulations in 19 California Code of Regulations (CCR) 2620, et seq., require local governments to regulate local business storage of hazardous materials in excess of certain quantities. The law also requires that entities storing hazardous materials be prepared to respond to releases. Those using and storing hazardous materials are required to submit a Hazardous Materials Business Plan (HMBP) to their local Certified Unified Program Agency (CUPA) and to report releases to their CUPA and the State Office of Emergency Services. The threshold quantities for hazardous materials are 55 gallons for liquids, 500 pounds for solids, and 200 cubic feet for compressed gases measured at standard temperature and pressure.

8.12.2.2.2 Health and Safety Code Section 25531 (California Accidental Release Program). California Health and Safety Code, Section 25531, et seq., and the California Accidental Release Program (CalARP) regulate the registration and handling of regulated substances. Regulated substances are any chemicals designated as an extremely hazardous substance by the U. S. Environmental Protection Agency (USEPA) as part of its implementation of Superfund Amendments and Reauthorization Act (SARA) Title III. Health and Safety Code Section 25531 overlaps or duplicates some of the requirements of SARA and the CAA. Facilities handling or storing regulated substances at or above TPQs must register with their local CUPA and prepare an RMP, formerly known as a Risk Management and Prevention Program (RMPP). The CalARP is found in Title 19, CCR, Chapter 4.5. The TPQ for ammonia is 500 pounds. Portions of the aqueous ammonia process that can be demonstrated to have a partial pressure of the regulated substance in the mixture (solution), under the handling or storage conditions, which is less than 10 millimeters of mercury (mm Hg) do not count toward the threshold.

8.12.2.2.3 Aboveground Petroleum Storage Act. Health and Safety Code Sections 25270 to 25270.13 ensure compliance with the federal CWA. The law applies to facilities that operate a petroleum AST with a capacity greater than 660 gallons or combined ASTs capacity greater than 1,320 gallons or oil-filled equipment where there is a reasonable possibility that the tank(s) or equipment may discharge oil in "harmful quantities" into navigable waters or adjoining shore lands. If a facility falls under these criteria, it must prepare a SPCC plan.

8.12.2.2.4 Safe Drinking Water and Toxics Enforcement Act (Proposition 65). This law identifies chemicals that cause cancer and reproductive toxicity, provides information for the public, and prevents discharge of the chemicals into sources of drinking water. Lists of the chemicals of concern are published and updated periodically. The Act is administered by California's Office of Environmental Health Hazard Assessment. Some of the chemicals to be used at the facility are on the cancer-causing and reproductive-toxicity lists of the Act.

The City of San Francisco is not subject to Proposition 65, based on the definition of person[1] in the Prop 65 law. Since the SFERP facility will be maintained and operated by the City, the SFERP facility is not subject to Proposition 65.

8.12.2.2.5 Natural Gas Pipeline Construction and Safety. The California Public Utilities Commission enforces General Order No. 58-A specifying standards for natural gas service in the State of California, and General Order No. 112-E specifying rules governing the design, construction, testing, operation, and maintenance of natural gas gathering, transmission, and distribution piping systems.

8.12.2.3 Local

The City and County of San Francisco (CCSF) has responsibility for administering hazardous materials requirements and ensuring compliance with federal and state laws in San Francisco.

8.12.2.3.1 Hazardous Materials Storage and Handling. The requirements for hazardous materials handling are specified in the San Francisco Public Health Code, enforced by the San Francisco Department of Public Health (SFDPH), Environmental Health Section. Article 21 incorporates the California Underground Storage Tank Regulations (California H&S Code, Chapters 6.7 and 6.75), Hazardous Materials Release Response Plans and Inventory Regulations requiring preparation of a Hazardous Materials Business Plan (HMBP) (California H&S Code, Chapter 6.95, Article 1), Aboveground Petroleum Storage Tank Regulations requiring preparation of a SPCC plan (California H&S Code, Section 25270.5), and hazardous materials management provisions of the Uniform Fire Code requiring Hazardous Materials Inventories (Uniform Fire Code, Sections 8001.3.2[a] and 8001.3.3[a]). It also provides for additional stricter local requirements. Article 21 also requires conformance with applicable hazardous materials requirements of the San Francisco Building Code, Electric Code, Public Works Code, Fire Code and City Planning Code. Article 80 of the San Francisco Fire Code incorporates the hazardous materials handling requirements of the Uniform Fire Code, discussed below, and is enforced by the San Francisco Fire Department.

8.12.2.3.2 Regulated Substances Handling. The requirements for handling of regulated substances, including the preparation of an RMP, are specified in Article 22A of the San Francisco Public Health Code, enforced by the SFDPH. This article incorporates the requirements of CalARP, described above.

8.12.2.4 Codes

The design, engineering, and construction of hazardous materials storage and dispensing systems will be in accordance with all applicable codes and standards, including the following:

- California Vehicle Code, 13 CCR 1160, et seq.—Provides the California Highway Patrol (CHP) with authority to adopt regulations for the transportation of hazardous materials in California.
- The California Fire Code, Articles 79 and 80—The hazardous materials sections of the Fire Code. Local fire agencies or departments enforce this code and can require that an HMBP and a Hazardous Materials Inventory Statement be prepared. This requirement

[1] Section 25249.11(b) of Proposition 65 exempts Cities and Counties from the definition of a person.

and the requirement for an HMBP can usually be satisfied in a single combined document. San Francisco adopted these articles of the California Fire Code into its municipal code in 1999. The California Fire Code is based on the Federal Fire Code.

- State Building Standard Code, Health and Safety Code Sections 18901 to 18949—Incorporates the UBC, Uniform Fire Code, and Uniform Plumbing Code.
- The American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section VIII.
- The American National Standards Institute (ANSI) K61.1.

8.12.3 Affected Environment

The project site is located in the City of San Francisco, adjacent to San Francisco Bay (see Figure 2-1). Land use in the surrounding area (discussed in detail in Subsection 8.4, Land Use) is primarily industrial and commercial with some associated residential. Sensitive receptors within a 3-mile radius of the project site include 233 schools and day care facilities, 221 churches, 15 hospitals and 32 Senior care facilities, and 57 parks and recreation centers. These receptors are listed in Table 8.12-2 and shown on Figure 8.6-1. The closest of these receptors is the Warm Water Cove Public Access area, a park located approximately 700 feet northeast of the project site. The nearest school is Starr King Elementary School located approximately 2845 feet to the west. The nearest day care facility is Cleo Wallace Child Growth Center located approximately 3528 feet to the northwest. The nearest hospital/long-term health care facility is the San Francisco General Hospital located approximately 5,937 feet to the west.

The nearest residence is located on the corner of Minnesota and 25th Street, approximately 1,632 feet west of the project site.

TABLE 8.12-2
Sensitive Land Uses Within 3 Miles of the Proposed Project

Schools and Daycare Facilities			
1	24th Street High Start	119	Love & Learn Nursery School
2	3n1 Preschool	120	Lucy Harber Academy
3	Academy of Art College	121	Luther Burbank Middle School
4	Adda Clevenger Jr Preparatory	122	M & J Daycare
5	After School Enrichment Program	123	Malcolm X Academy Elementary School
6	After Six High School	124	Marin Day School
7	Alemany Campus	125	Marin Day School
8	Alvarado Elementary School 420	126	Marin Day School
9	American College of Early	127	Marin Day Schools
10	Angel Childcare For Infants	128	Marin Day Schools
11	Aria School For Exceptional Children	129	Marin Day Schools
12	Bay View Daycare	130	Marshall Academic High School
13	Bayview Academy	131	Marshall Elementary School

TABLE 8.12-2
Sensitive Land Uses Within 3 Miles of the Proposed Project

14	Bessie Carmichael Elementary School	132	Martin Luther King Middle School
15	Big City Montessori School	133	McKinley Elementary School
16	Bret Harte Elementary School	134	M'Eadd Preparatory Day Care
17	Bret Harte Pre-K School	135	Meadows Livingstone School
18	Bridgemont High school	136	Mission Child Care Center
19	Bridgeview Daycare	137	Mission Child Development Center
20	Bryant Child Development Center	138	Mission Dolores Elementary School
21	Bryant Elementary School	139	Mission Education Center
22	Buen Dia Family School	140	Mission Head Start-673 Valencia St
23	Buena Vista Alternative Elementary / Child Care	141	Mission Head Start-3543 18th St.
24	Burnett Children Center	142	Mission High School-3141 26th St
25	Burnett Nursery & School-Age	143	Mission Neighborhood Ctr-152 Berry St
26	California College Arts Crafts	144	Mission Neighborhood Ctr-673 Valencia St
27	California Institute of integral Studies	145	Mission Neighborhood Ctr-3141 26th St
28	Capp Center Head Start	146	Mission Neighborhood Waldorf School
29	Cathedral School for Boys	147	Monroe Elementary School
30	Cesar Chavez Prekindergarten	148	Montessori House of Children
31	Charles R Drew Nursery	149	Mountain Crest Academy
32	Chavez Elementary School	150	Munchkinland-Child Care
33	Child Field Day Care	151	New College of California
34	Children's Day School	152	Noe Valley Nursery School
35	Children's Village	153	Notre Dame des Victories School
36	Chinese American International School	154	Open Mind
37	Chinese Central High school	156	Open Mind School
38	Chinese Education Center	157	Our Lady of the Visitation School
39	City College of San Francisco	158	Pacific Gas Children's Ctr
40	Cleo Wallace Child Growth Center	159	Parkview Place Children’s Center
41	Cleveland Elementary School	160	Paul Revere Elementary School
42	Companeros Del Barrio Pre School	161	Paul Revere Annex Elementary School
43	Cornerstone Academy	162	Peace Site Academy Elementary
44	Cornerstone Academy	163	Peppertree Day Care & Program
45	Corpus Christi School	164	Philip and Sala Burton High School
46	Creative Arts Charter School	165	Phoebe Hearst Preschool Center
47	Cross Cultural Family Center	166	Potrero Hill Middle School
48	Cross Cultural Family Center	167	Preschool
49	Cumberland Chinese School	168	Rise Institute
50	CW's Child Care Service	169	Rocky Mountain Participation

TABLE 8.12-2
Sensitive Land Uses Within 3 Miles of the Proposed Project

51	Cyo Mission Day Care	170	Rooftop Alternative Elem School
52	Daniel Webster Elementary School	171	Roof Top K8th School
53	Delta Preschool	172	Rose Parks Elementary School
54	Downtown Continuation High School	173	SF Cares
55	Dr. Charles R Drew Elementary	174	Sacred Heart Catholic Prep School
56	Eben Ezer Family Day Care	175	Sacred Heart Grammar School
57	Edison Charter Academy	176	San Francisco Community
58	Edward R Taylor Elementary / Pre K School	177	San Francisco City College
59	El Dorado Elementary School	178	San Francisco Friends School
60	Enola D Maxwell Middle School	179	San Francisco Head Start-824 Carolina St
61	Eureka Learning Center	180	San Francisco Head Start-125 W Point Rd
62	Evertt Middle School	181	San Francisco Law School
63	Excelsior Child Dev Center Monroe	182	San Francisco School
64	Fairmount Elementary School	183	San Francisco University Head Start
65	Family Development Center	184	San Francisco Unified School
66	Fellowship Academy & Pre-school	185	San Francisco Waldorf High
67	Filipino Immersion Program	186	San Francisco Waldorf High
68	First Baptist Church-International School	187	San Paths Academy
69	Flynn Elementary School	188	Sanchez Elementary School
70	Forest Hill Montessori School	189	Sanchez Pre-Kindergarten
71	Frandelja Enrichment	190	School-Applied Science & Technology
72	French-American International School	191	Seneca Center - San Francisco
73	Friends of Potrero Hill Nursery	192	Sojourner Truth Child Care Center
74	Friends of St Francis Child Care	193	Sr Martin College Preparatory
75	George R Moscone Elementary	194	St Anthony's Elementary/ Immaculate School
76	George Washington Carver Elementary School	195	St Charles Catholic School
77	Girls 2000	196	St Charles School
78	Glen Park Elementary School	197	St Elizabeth School
79	Glen Park Pre-School	198	St James Elementary School
80	Gloria B Davis Middle School	199	St John's School
81	Golden Gate University	200	St Nicholas Child Care Center
82	Gordon J Lau Elementary School	201	St Paul of Shipwreck School
83	Harriet Street Day Activity	202	St Paul’s Elementary School
84	Harvey Milk Civil Rights Elementary School	203	St Paul's Intermediate School
85	Hastings College of the Law	204	St Peter School
86	Hayes Valley Site	205	St Philip's School
87	Head Start	206	Starr King Elementary School

TABLE 8.12-2
Sensitive Land Uses Within 3 Miles of the Proposed Project

88	Head Start	207	Stevenson Child Care Center
89	Heald Business College - SF	208	Stuart Hall High School
90	Healthy Environment	209	Synergy Elementary School
91	Hillcrest Elementary School	210	Tanisha's Daycare
92	Holy Family Day Home	211	Theresa S Mahler Child Dev Prg
93	Horace Mann Middle School	212	Thurgood Marshall High School
94	Ida B Wells-Mark Twain High School	213	Touro College
95	Ideal Daycare	214	Trevor Martin Montessori School
96	Immaculate Conception Academy	215	Trinity Business College
97	International Christian School	216	True Sunshine Preschool Ctr
98	International Studies Academy	217	Twelve Hugs Children's Center
99	James Lick Middle School	218	Twenty-First Century Academy
100	Jewish Community High School	219	UC-Hastings College of Law
101	John A O'Connell High school	220	Victoria's Family Daycare
102	John Muir Elementary / Pre-Kindergarten School	221	Visitacion Valley Middle School
103	John Swett Elementary School	222	Walden House School
104	Joshua Marie Cameron Academy	223	Walden School
105	Junipero Serra Elementary School	224	West Portal Care Inc. 65 Chenery St
106	Karen's Family Day Care	225	Whitney Young Child Day Center
107	Kate Kennedy Children's Center	226	World Academy of Keristan
108	Katherine Michiels School	227	Wu Yee Children's Service
109	Kiddieland Happy Face Place	228	Wu Yee Children's Service
110	La Mel Middle School	229	Yebra Buena Gardens Child Development
111	Las Americas Children Center	230	YMCA-4080 Mission St
112	Leadership Charter High School	231	YMCA of San Francisco-631 Howard St
113	Leaping For Joy License Child	232	Yoey Children Center
114	Leonard R Flynn Elementary	233	Youth Chance High School
115	Leonard R Flynn School-Age		
116	Little Bear School		
117	Littlest Angel Prep Preschool		
118	Live Oak School		
Hospitals			
1	Ca Pacific Medical Center	9	St. Luke's Hospital
2	Chinese Hospital	10	St. Luke's Hospital
3	David, Jeanne-Pacific Pediatrics Group Inc	11	St. Luke's Hospital
4	Davies Medical Center-San Francisco	12	St. Francis Memorial Hospital
5	Drumm Medical Center	13	Sutter Health Western Division

TABLE 8.12-2
Sensitive Land Uses Within 3 Miles of the Proposed Project

6	Ocadian Hospitals and Care Center	14	University-California Renal
7	San Francisco General Hospital	15	U.S. Veterans Center
8	Sheffield Convalescent Hospital		
Senior Centers			
1	American Filipino Senior Club	13	Network for Elders
2	Autumn Glow	18	New Leaf
3	Bayview Hunters Point Senior	19	Nob Hill Healthcare Center
4	Bayview Hunters Point Senior	20	Noe Valley Senior Center
5	Central Gardens Convalescent	21	On Lok 30th St Senior Service
6	Curry Senior Center	22	Philippines American Senior Center
7	Diamond Senior Center	223	Presentation Senior Community
8	Episcopal Sanctuary Canon Kip	24	San Francisco Adult Day Service
9	Fancis of Assisi Community	25	San Francisco Senior Center
10	Golden Gate for Seniors	26	San Francisco Towers
11	Hayes Convalescent Hospital	27	St Anthony Foundation
12	Hayes Valley Care	28	Sheffield Convalescent Hospital
13	Jewish Home for Aged Day Center	29	University Mound Ladies Home
14	Life Management Assoc.	30	Verne S Doxey Inc
15	Mendelsohn House	31	Visitation Valley Community Center
16	Mission Bay Convalescent Hospital	32	West Bay Philipino Senior Center
17	Neighborhood Elders Support		
Parks and Recreation Centers			
1	3COM Park	30	Folsom
2	Adams Rogers	31	John Maclaren
3	Alamo Square	32	Juri Street
4	Ampco System	33	Justin Herman Plaza
5	Bayview	34	Koshland
6	Bayview Play Ground	35	Margaret S Hayward Play Ground
7	Bernal Heights	36	Mckinley Square
8	Billy Goat Hill	37	Mission Dolores Park
9	Civic Center Plaza	38	Mission Playground
10	Corona Heights Playground	39	O'Farrell Street Park
11	Douglas Playground	40	Palega Recreation Center
12	Duboce	41	Portola Recreation Center
13	Esprit Park	42	Portsmouth Square
14	Eureka Valley Recreation Center	43	Postmouth Square
15	Fairmount Plaza	44	Potrero del Sol

TABLE 8.12-2
Sensitive Land Uses Within 3 Miles of the Proposed Project

16	Franklin Square Park	45	Potrero Hill Recreation Center
17	Garfield Square	46	Precita
18	George Christopher Playground	47	Rolph Play Ground
19	Gilman Playground Park	48	Saint Mary's
20	Hallidie Plaza	49	Silver Terrace Play Ground
21	Hayward Playground	50	South of Market Park
22	Heron's Head Park	51	South Park
23	Hilltop	52	Union Square Parks
24	Holly Park	53	Upper Noe Recreation Center
25	Indian Basin Shoreline Play Ground	54	Walter Hass Play Ground
26	Islais Creek Public Access Area	55	Warm Water Cove Public Access Area
27	Jackson Play Ground	56	Yerba Buena Gardens
28	Jefferson Square	57	Youngblood Coleman Play Ground
29	Potrero Hill Playground		
Churches			
1	Abundant Life Church of God	112	Korean First Presbyterian Church
2	Advent of Christ the King	113	Korean Presbyterian Church
3	African Orthodox Church	114	La Raza Community Resource Center
4	All Saints Church	115	Latvian Lutheran Church
5	Allen Chapel	116	Little Bethany Baptist Church
6	American Chinese Presbyterian	117	Lourdes Center
7	American Indian Baptist Church	118	Matthew Zion Baptist Church
8	Apostleship of the Sea	119	Metropolitan Baptist Church
9	Apostolic Church of the Faith	120	Mision Evangelica Peniel
10	Arc Apostolato Radio	121	Mission Bay Community Church
11	Arca De Dios Church	122	Mission Dolores Basilica
12	Archdiocese of San Francisco	123	Mission Korean Presbyterian
13	Ark of Refuge Inc	124	Most Holy Redeemer Church
14	Ascension Baptist Church	125	Mount Gilead Baptist Church
15	Baha'I Faith-San Francisco Center	126	Mt. Enon Baptist Church
16	Baptist Church Second Union	127	Mt. Trinity Baptist Church
17	Bayview Baptist Church	128	Neighborhood Baptist Church
18	Bayview Jehovah's Witnesses	129	New Antioch Baptist Church
19	Bayview Tabernacle Baptist Church	130	New Beginning Church of God
20	Bell Chapel Christian Methodist Church	131	New Home Missionary Baptist Church
21	Bethel Cathedral	132	New Hope Alliance Church
22	Bethel Christian Church	133	New Life Deliverance Center

TABLE 8.12-2
Sensitive Land Uses Within 3 Miles of the Proposed Project

23	Bethel Temple United Holy Church	134	Noe Valley Ministry
24	Calvary Apostolic Church	135	Notre Dame Des Victoires
25	Center for Young Woman Develop	136	Old St. Mary's Cathedral
26	Chabad of Noe Valley	137	Olivet Baptist Church
27	Children Evangelism Fellowship	138	Open Bible Church
28	Chinese Independent Baptist	139	Orthodox Catholic Church
29	Chinese United Methodist Church	140	Our Lady of Lourdes Church
30	Chozen-Ji Ca Betsuin Rinzai	141	Pathfinders Miss Baptist Church
31	Christ Missionary Baptist Church	142	Perszim Christian Liberty
32	Christian Science Church	143	Philadelphia Church of God
33	Christian Science Reading Room	144	Phioptochos Society Docese
34	Church of Christ	145	Portola Baptist Church
35	Church of God	146	Presbyterian Church-Chinatown
36	Church of God of Prophecy	147	Primera Lglesia Bautista Del
37	Church of Natural Grace	148	Promised Land Fellowship
38	Church of Scientology Mission	149	Providence Baptist Church
39	Church of St Gregory Nyssen	150	Rainbow Seventh-Day Adventist
40	Church of the Sojorners	151	Redeemer Community Church
41	Church-The Nativity-our Lord	152	Rigpa San Francisco Center
42	City of Refuge United Church	153	Roca De Salvacion
43	City View Church	154	Rock of Ages Church
44	Congregation Keneseth Israel	155	Russian Gospel Temple
45	Congregation Sherith Israel	156	SF Gospel Mission
46	Cornerstone Church	157	Sacred Heart Church
47	Corpus Christi Church	158	Salvation Army
48	Cornerstone Evangelical Baptist	159	Salvation Army Adult Rehab Center
49	Cornerstone Missionary Baptist	160	San Francisco Church of God
50	Cultural Integration Fellowship	161	San Francisco Friends Meeting
51	Cumberland Presbyterian Church	162	San Francisco Lighthouse
52	Double Rock Baptist Church	163	Second Union Baptist Church
53	Dolores Street Baptist Church	164	Seventh-Day Adventist Church
54	Ebenezer Baptist Church	165	Seventh-Day Adventist Tabernacle
55	El Bethel Baptist Church	166	Shilo Full Gospel Church
56	Emanuel Baptist Church	167	Soka Gakkai Intl USA
57	Encuentro Del Canto Popular	168	Spanish Speaking Baptist Church
58	Evergreen Baptist Church	169	St Anthony's Church
59	Faith Temple Church of God	170	St Boniface Church-Franciscans

TABLE 8.12-2
Sensitive Land Uses Within 3 Miles of the Proposed Project

60	First Baptist Church	171	St. Charles Church
61	First Chinese Baptist Church	172	St. Elizabeth's Church
62	First Chinese Southern Baptist	173	St. Francis Lutheran Church
63	First Church of God-Anderson	174	St. James Baptist. Church
64	First Congregational Church	175	St. James Catholic Church
65	First Friendship institutional	176	St. James Presbyterian Church
66	First Pentecostal Church-Jesus	177	St. John Missionary Baptist
67	First Russian Christian Moloka	178	St. John The Evangelist. Catholic
68	First Samoan Congregational	179	St. John The Evangelist. Episcopalian
69	First Togan Free Weslyan Church	180	St. Kevin's Church
70	First Union Baptist Church	181	St. Luke's Baptist. Church
71	Flower Hill Baptist Church	182	St. Mark's Institutional Baptist
72	Free Evangelic Church Full	183	St. Mary's Cathedral Assumption
73	Free Methodist Church	184	St. Mary's Catholic Church
74	Freedom in Christ Evangelical	185	St. Matthew Lutheran Church
75	Galilee Baptist Church	186	St. Patricks Church
76	Glide Memorial Methodist Church	187	St. Paul of the Shipwreck Church
77	Good Hope Baptist Church	188	St. Paul of the Shipwreck Church
78	Good Samaritan Church	189	St. Paul Tabernacle Baptist. Church
79	Good Samaritan Episcopal Church	190	St. Paul's Catholic Church
80	Good Shepherd Baptist Church	191	St. Peter's Catholic Church
81	Grace Fellowship Community Church	192	St. Peters Missionary Baptist
82	Greaer Life Ministeries	193	St. Peter's School Special Service
83	Great Shepherd Baptist Church	194	St. Phillips Church
84	Greater Gethsemane Cogic	195	St. Stephen Baptist. Church
85	Greater New Light Baptist Church	196	St. Teresa's Church
86	Greater New St John Missionary	197	Star of Hope Missionary Bapt
87	Greater Prosperity Missionary	198	Sufi Islamia Ruhaniat Society
88	Hamilton Square Baptist Church	199	Supreme Master Ching Hai Intl
89	Holiness Temple In Christ	200	Tabernacle of Faith Missionary
90	Holy Innocents Episcopal Church	201	Templo De La Fe Asamblea
91	Holy of Holliness	202	Templo El Calvario Assemblies
92	Hosea Channels of Blessing Church	203	Third Baptist Church
93	Hosea Channels of Blessing Church	204	Tree of Life Baptist Church
94	House of God in San Francisco	205	Tri-Unity Missionary Baptist
95	Igl. Bau Del Valle Baptist Church	206	True Hope Church-God In Christ
96	Iglesia De Dios Pentecostal	207	True Light Church of God

TABLE 8.12-2
Sensitive Land Uses Within 3 Miles of the Proposed Project

97	Iglesia Del Pacto Evangelico	208	Tsa Tsa Studio
98	Iglesia Fuente De Vida	209	Ukrainian Catholic Church
99	Iglesia No Temas Porque Yo	210	Ukrainian Orthodox Church
100	Iglesia Presbiteriana-Mission	211	Union Spring Baptist Church
101	Iglesia San Juan 14 6	212	United House-Prayer for All
102	Iglesia Sion	213	Valley Baptist Church
103	Immaculate Conception Church	214	Verbum Dei Missionary Fraternity
104	Immanuel Baptist Church	215	Victory Outreach
105	Indonesian Evangelical Church	216	Vietnamese Buddihist Assn of SF
106	Innerchange	217	Visitacion Chinese Baptist Church
107	International Christian School	218	Visitation Church
108	James Memorial Church of God	219	Voice of Christ Full Gospel
109	Jehovah's Witnesses	220	Zhou Yu Zhang
110	Jehovah's Witnesses	221	Zion Chapel Church of God
111	Jesus Cristo Es El Senor		

As discussed in Subsection 8.12.5, Offsite Migration Modeling, releases to the north, south, and eastern boundaries of the SFERP will not exceed a concentration of 5 ppm. The area potentially affected by any release of aqueous ammonia in excess of 2,000 ppm would not extend more than 35 feet westward from the tank, just over the project fence line onto the proposed MUNI Metro East Maintenance and Operations Center. This will affect only the proposed MUNI Maintenance and Operations Center which is inaccessible to the general public. Mitigation measures proposed by the Applicant to protect the health and safety of the MUNI employees is further discussed in Subsection 8.12.8.2.2. There are no schools, hospitals, day-care facilities, emergency response facilities or long-term health care facilities located within the area potentially affected by any release of hazardous materials. (See the figure required by CEC Siting Regulations, Title 20, Division 2, Chapter 5, Appendix B (g) (10) (B), Figure 8.6-1, which shows the project site and surrounding area on a map at a scale 1:24,000.)

8.12.4 Potential Environmental and Human Health Effects

Construction and operation of the project will involve the use of various hazardous materials and one regulated substance. The potential environmental and human health impacts related to the use of these materials are discussed in this section.

8.12.4.1 Construction Phase

The quantities of hazardous materials that will be onsite during construction are small relative to the quantities used during operation. They will be limited to gasoline, diesel fuel, motor oil, hydraulic fluid, solvents, cleaners, sealants, welding flux, various lubricants, paint, and paint thinner. There are no feasible alternatives to vehicle fuels and oils for

operating construction equipment. The types of paint required are dictated by the types of equipment and structures that must be coated and by the manufacturers' requirements for coating.

Use of these materials during construction will not present a public health risk because the use would be subject to the requirements of Article 21 of the San Francisco Health Code, described further in Subsection 8.12.8.2.1, and because there is a negligible chance that surface water or groundwater could be affected. As explained in more detail in Subsection 8.14, Water Resources, stormwater discharges from the construction site would be subject to the requirements of the City's permit and must be in compliance with the nine minimum controls described in the Federal Combined Sewer Overflow Control Policy (CSO Policy) and specified in the City's NPDES permit.

The project site is also subject to the "Risk Management Plan and Site Management Plan" (RMP/SMP) for the MUNI Metro East Light Rail Vehicle Maintenance and Operations Facility (AGS, Inc., 2000). Section 5.0 of the RMP/SMP describes risk management measures required during development, including specific dust control measures, health and safety planning requirements, and measures minimizing workers' exposure to soil and groundwater. Section 8.0 of the RMP/SMP specifies additional site management requirements during construction, including dewatering controls, equipment decontamination, soil management protocols, and standards for imported soil. Further discussion about the RMP/SMP may also be found in Section 8.13, Waste Management.

Through compliance with these requirements, potential environmental effects from the use of hazardous materials during construction are less than significant. In addition, the hazardous materials used during construction will be registered with the SFDPH in accordance with Article 21 of the San Francisco Public Health Code if threshold quantities of storage are exceeded.

Regulated substances, as defined in California's Health and Safety Code, Section 25531, will not be used during construction of the project. Therefore, no discussion of regulated substances storage or handling is included in this subsection.

8.12.4.2 Operations Phase

Storage locations for the hazardous materials that will be used during operation are described in Table 8.12-3. Table 8.12-4 presents information about these materials, including trade names, chemical names, Chemical Abstract Service (CAS) numbers, maximum quantities onsite, RQs, CalARP TPQs, and status as a Proposition 65 chemical (a chemical known to be carcinogenic or cause reproductive problems in humans). Health hazards and flammability data are summarized for these materials in Table 8.12-5, which also contains information on incompatible chemicals (e.g., sodium hypochlorite and ammonia).

A maximum of approximately 38,815 gallons and 100 pounds of hazardous materials and regulated substances will be stored for the project. Most of the hazardous substances that will be used by the project are required for treatment and laboratory analysis of the cooling water, facility maintenance, and lubrication of equipment, or will be contained within transformers and electrical switches. The only regulated substance that will be used for the project is aqueous ammonia; toxicity characteristics and the exposure level criteria for

TABLE 8.12-3
Storage Location and Use of Hazardous Materials During Project Operation

Chemical	Use	Storage Location	State	Type of Storage
Aqueous Ammonia (29% NH_3 by weight)	Control oxides of nitrogen (NO_x) emissions as part of selective catalytic reduction system	West side adjacent to chillers	Liquid	Continuously Onsite
Aluminum Sulfate, Sodium Aluminate	Coagulant for plant makeup water	Water treatment building	Liquid	Continuously Onsite
Antiscalant*	Prevent scale in reverse osmosis membranes	Water treatment building	Liquid	Continuously Onsite
Citric Acid (50%)	pH control of upstream of reverse osmosis equipment	Wastewater Treatment building	Liquid	Continuously Onsite
Cleaning Chemicals/Detergents	Periodic cleaning	Shop/warehouse area	Liquid	Continuously Onsite
Coagulant Aid Polymer (e.g., NALCO NALCOLYTE 8799)*	Coagulant for plant makeup water	Water treatment building	Liquid	Continuously Onsite
Corrosion Inhibitor (NALCO 8305 Plus)*	Cooling tower cooling water corrosion inhibitor	Near chiller cooling tower	Liquid	Continuously Onsite
Dispersant (NALCO TRASAR 23263)*	Cooling tower cooling water dispersant	Near chiller cooling tower	Liquid	Continuously Onsite
Ferric Chloride or Ferric Sulfate	Coagulant for plant makeup water	Water treatment building	Liquid	Continuously Onsite
Laboratory Reagents	Water/wastewater laboratory analysis	Water treatment building	Liquid and Granular Solid	Continuously Onsite
Synthetic Turbine Lubricating Oil	Lubricate rotating equipment (e.g., gas turbine lube oil systems)	Contained within storage tanks on equipment skids	Liquid	Continuously Onsite
Mineral Generator Lubricating Oil	Lubricate rotating equipment (e.g., generator lube oil systems)	Contained within storage tanks on equipment skids	Liquid	Continuously Onsite
Mineral Transformer Insulating Oil	Transformers/switchyard	Contained within transformers and electrical switches	Liquid	Continuously Onsite
Scale Inhibitors (Polyacrylate)	Cooling tower scale inhibitor	Near chiller cooling towers	Liquid	Continuously Onsite

TABLE 8.12-3
Storage Location and Use of Hazardous Materials During Project Operation

Chemical	Use	Storage Location	State	Type of Storage
Sodium Bisulfite (38-70%, NALCO 7804)	Remove free chlorine in reclaimed water upstream of reverse osmosis system and wastewater treatment	Water treatment building and wastewater treatment building	Liquid	Continuously Onsite
Sodium Bromide (NALCO STABREX ST40)	Cooling tower biocide and process water pretreatment	Near chiller cooling towers and water treatment building	Liquid	Continuously Onsite
Sodium Hydroxide (50% Caustic)	pH control upstream of reverse osmosis equipment and wastewater treatment	Water treatment building and wastewater treatment building	Liquid	Continuously Onsite
Sodium Hypochlorite (10.3 - 12% NaOHCl)	Biocide to treat inlet reclaimed water/ cooling tower biocide and process water pretreatment /and wastewater treatment	Water treatment building/ near chiller cooling tower/ wastewater treatment building	Liquid	Continuously Onsite
Sulfuric Acid (93 - 98%)	Enhance back flush of ultra filter system/ cooling tower cooling water pH control	Water treatment building/ near chiller cooling tower	Liquid	Continuously Onsite

Note:

* MSDS for these chemicals are available in Appendix 8.12B

TABLE 8.12-4
Chemical Inventory, Description of Hazardous Materials Stored Onsite, and Reportable Quantities

Trade Name	Chemical Name	CAS Number	Maximum Quantity Onsite	CERCLA SARA RQ[a]	RQ of Material as Used Onsite[b]	LaFollette Bill TPQ[c]	Prop 65
Regulated Substances							
Aqueous Ammonia (29% solution)	Ammonium Hydroxide	1336-21-6 (for NH_3 –H_2O)	10,000 gal.	100 lb	500 lb	500 lb	No
Hazardous Materials							
Aluminum Sulfate[d]	Aluminum Sulfate	10043-01-3	800 gal.	5,000 lb	5,000 lb	[e]	No
Sodium Aluminate[d]	Sodium Aluminate	1302-42-7	400 gal.	[e]	[e]	[e]	No
Antiscalant	Anti-scalant	None	200 gal.	[e]	[e]	[e]	No
Citric Acid	Citric Acid (50 percent)	77-92-9	100 gal.	[e]	[e]	[e]	No
Cleaning Chemicals/Detergents	Various	None	20 gal.	[e]	[e]	[e]	No
Coagulant Aid Polymer (e.g. NALCO NALCOLYTE 8799)	Sodium Chloride	7647-14-5	400 gal.	[e]	[e]	[e]	No
	Polyquaternary Amine	20507700000-5062P		[e]	[e]	[e]	
Corrosion Inhibitor (NALCO 8305 Plus)	Cooling tower cooling water corrosion inhibitor	None	200 gal.	[e]	[e]	[e]	No
Dispersant (NALCO TRASAR 23263)	Cooling tower cooling water dispersant	64665-57-2	200 gal.	[e]	[e]	[e]	No
Ferric Chloride[d]	Ferric Chloride	7705-08-0	400 gal.	1,000 lb	1,000 lb	[e]	No
Ferric Sulfate[d]	Ferric Sulfate	10028-22-5	400 gal.	1,000 lb	1,000 lb	[e]	No
Laboratory Reagents (liquid)	Various	None	20 gal.	[e]	[e]	[e]	No
Laboratory Reagents (solid)	Various	None	100 lb	[e]	[e]	[e]	No
Synthetic Turbine Lubrication Oil	Oil	None	560 gal.	42 gal.[f]	[g]	[e]	Yes
Mineral Generator Lubrication Oil	Oil	None	1,570 gal.	42 gal.[f]	[g]	[e]	Yes

TABLE 8.12-4
Chemical Inventory, Description of Hazardous Materials Stored Onsite, and Reportable Quantities

Trade Name	Chemical Name	CAS Number	Maximum Quantity Onsite	CERCLA SARA RQ[a]	RQ of Material as Used Onsite[b]	LaFollette Bill TPQ[c]	Prop 65
Mineral Transformer Insulating Oil	Oil	8012-95-1	21,000 gal.	42 gal.[f]	[g]	[e]	Yes
Scale Inhibitors (various)	Polyacrylate	Various	400 gal.	[e]	[e]	[e]	No
Sodium Bisulfite (NALCO 7804)	Sodium Bisulfite (38 to 70 percent)	7631-90-5	450 gal.	5,000 lb	7,143 lb	[e]	No
Sodium Bromide (NALCO STABREX ST40)	Sodium Hydroxide (1 to 5 percent)	1310-73-2	200 gal.	1,000 lb	20,000 lb	[e]	No
Sodium hydroxide (caustic)	Sodium Hydroxide (50 percent)	1310-73-2	425 gal.	1,000 lb	20,000 lb	[e]	No
Sodium Hypochlorite (Bleach)	Sodium Hypochlorite (10.3-12 percent)	7681-52-9	400 gal.	100 lb	1,000 lb	[e]	No
Sulfuric Acid	Sulfuric Acid (93 – 98 percent)	7664-93-0	400 gal.	1,000 lb	1,075 lb	[e]	No

[a] Reportable quantity for a pure chemical, per the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) [Ref. 40 CFR 302, Table 302.4]. Release equal to or greater than RQ must be reported. Under California law, any amount that has a realistic potential to adversely affect the environment or human health or safety must be reported.

[b] Reportable quantity for materials as used onsite. Since some of the hazardous materials are mixtures that contain only a percentage of a reportable chemical, the reportable quantity of the mixture can be different than for a pure chemical. For example, if a material only contains 10 percent of a reportable chemical and the RQ is 100 lb, the reportable quantity for that material would be (100 lb)/(10%) = 1,000 lb.

[c] Threshold Planning Quantity [Ref. 40 CFR Part 355, Appendix A]. If quantities of extremely hazardous materials equal to or greater than TPQ are handled or stored, they must be registered with the local Administering Agency.

[d] Some of the chemicals have alternatives (See Table 8.12-1), thus the maximum quantity stored onsite can be zero if an alternative chemical is being used.

[e] No reporting requirement. Chemical has no listed RQ or TPQ.

[f] State reportable quantity for oil spills that will reach California state waters [Ref. CA Water Code Section 13272(f)].

[g] Per the California Regional Water Quality Control Board, Region 2, they would like all oil spills to surface water reported, even for less than the state reportable quantity of 42 gal.

TABLE 8.12-5
Toxicity, Reactivity, and Flammability of Hazardous and Regulated Substances Stored Onsite

Hazardous Materials	Physical Description	Health Hazard	Reactive & Incompatibles	Flammability*
Regulated Substances				
Aqueous Ammonia	Liquid, vapor is colorless gas with pungent odor	Corrosive: Irritation to permanent damage from inhalation, ingestion, and skin contact	Acids, halogens (e.g., chlorine), strong oxidizers, salts of silver and zinc	Liquid is incombustible; vapor is combustible, but difficult to burn
Hazardous Materials				
Aluminum Sulfate	Liquid	Toxic: Moderately toxic by ingestion	None	Nonflammable
Sodium Aluminate	Straw-colored liquid	Strong irritant to tissue	Acids and strong oxidizing agents	Nonflammable
Antiscalant	Amber liquid	May cause slight irritation to the skin and moderate irrigation to the eyes	None	Nonflammable
Citric Acid	Colorless translucent crystals	Skin and mucous membrane irritant and severe eye irritant	Strong bases and oxidizing agents	Nonflammable
Cleaning Chemicals/Detergents	Liquid	Refer to individual chemical labels	Refer to individual chemical labels	Refer to individual chemical labels
Coagulant Aid Polymer (e.g. NALCO NALCOLYTE 8799)	Light yellow liquid	May cause irritation to skin and eyes with prolonged contact	Strong oxidizers	Nonflammable
Corrosion Inhibitor (NALCO 8305 Plus)	Light yellow liquid, sweet organic odor	Irritant to eyes, skin, and respiratory tract	Strong oxidizers, strong acids, and reactive metals	Nonflammable
Dispersant (NALCO TRASAR 23263)	Clear amber liquid	None	None	Nonflammable
Ferric Chloride	Clear, yellow-orange liquid	Corrosive: Causes burns to eyes and skin; ingestion may cause stomach pain, nausea, vomiting, shock, and diarrhea	Heat and evaporation	Nonflammable
Ferric Sulfate	Dark reddish-brown solution with mild odor	Corrosive: May cause irritation to mucous membranes, respiratory tract and lung tissue if inhaled or burns to skin and eyes; ingestion can cause stomach irritation, digestive tract burns, liver cirrhosis and fibrosis of pancreas	Cast iron/bronze, brass, 304ss, hastelloy B, copper and alloys, galvanized steel, aluminum, paints, enamels, and concrete	Nonflammable

TABLE 8.12-5
Toxicity, Reactivity, and Flammability of Hazardous and Regulated Substances Stored Onsite

Hazardous Materials	Physical Description	Health Hazard	Reactive & Incompatibles	Flammability*
Laboratory Reagents	Liquid and solid	Refer to individual chemical labels	Refer to individual chemical labels	Refer to individual chemical labels
Lubrication Oil	Oily, dark liquid	Hazardous if ingested	Sodium hypochlorite	Flammable
Mineral Insulating Oil	Oily, clear liquid	Minor health hazard	Sodium hypochlorite	Can be combustible, depending on manufacturer
Scale Inhibitors (Polyacrylate)	Yellow green liquid	Corrosive and Toxic: Slight to moderate toxicity; irritation to skin and eyes	Strong acids	Nonflammable
Sodium Bisulfite	Yellow liquid	Corrosive: Irritation to eyes, skin, and lungs; may be harmful if digested	Strong acids and strong oxidizing agents	Nonflammable
Sodium Bromide	White crystals, granules, or powder; odorless	Causes irritation to skin, eyes, and respiratory tract; can cause damage to central nervous system if ingested	Acids, alkaloidal and heavy metal salts, oxidizers, and bromine trifluoride	Nonflammable
Sodium Hydroxide	Clear yellow liquid	Corrosive: Irritant to tissue in presence of moisture; strong irritant to tissue by ingestion	Water, acids, organic halogens, some metals	Nonflammable
Sodium Hypochlorite (Bleach)	Pale green; sweet, disagreeable odor. Usually in solution with H_2O or sodium hydroxide	Corrosive and Toxic: Toxic by ingestion; strong irritant to tissue	Ammonia and organic materials	Fire risk when in contact with organic materials
Sulfuric Acid	Colorless, dense, oily liquid	Strongly Corrosive: Strong irritant to all tissue; minor burns to permanent damage to tissue	Organic materials, chlorates, carbides, fulminates, metals in powdered form; reacts violently with water	Nonflammable

Data were obtained from Material Safety Data Sheets (MSDSs) and Lewis, 1991.

* Per Department of Transportation regulations, under 49 CFR 173: “Flammable” liquids have a flash point less than or equal to 141° F; “Combustible” liquids have a flash point greater than 141° F.

ammonia are included in Table 8.12-6. Alternatives to the use of the 29 percent solution of aqueous ammonia were considered, as discussed in Section 9 (Alternatives) and no feasible alternatives were identified. The use of ammonia generation technologies (urea to ammonia) are not feasible for this project as these processes require steam to be available on the project site and the SFERP project will not be generating steam. Furthermore, these technologies have not been installed on peaking units. The SFERP facility will store the 29-percent aqueous ammonia solution in a single stationary aboveground storage tank. The capacity of the tank will be approximately 12,000 gallons and the maximum quantity onsite will not exceed approximately 10,000 gallons. The tank will be surrounded by a secondary containment structure capable of holding the full contents of the tank, approximately 665 square feet (38 feet by 17.5 feet). The floor of the secondary containment structure will drain to a 24-inch-diameter drain that will lead to an underground spill containment vault (14 feet by 18 feet by 6 feet) via a 4-inch drain line.

TABLE 8.12-6
Toxic Effects and Exposure Levels of Regulated Substances

Name	Toxic Effects	Exposure Levels-Pure NH3
Aqueous Ammonia (29 percent solution)	Toxic effects for contact with pure liquid or vapor causes eye, nose, and throat irritation, skin burns, and vesiculation. Ingestion or inhalation causes burning pain in mouth, throat, stomach, and thorax, constriction of thorax, and coughing followed by vomiting blood, breathing difficulties, convulsions, and shock. Other symptoms include dyspnea, bronchospasms, pulmonary edema, and pink frothy sputum. Contact or inhalation overexposure can cause burns of the skin and mucous membranes, headache, salivation, nausea, and vomiting. Other symptoms include labored breathing, bloody mucous discharge, bronchitis, laryngitis, hemmoptysis, and pneumonitis. Damage to eyes may be permanent, including ulceration of conjunctiva and cornea and corneal and lenticular opacities.	Occupational Exposures: PEL = 35 mg/m^3 OSHA TLV = 18 mg/m^3 ACGIH TWA = 25 mg/m^3 NIOSH STEL = 35 mg/m^3 Hazardous Concentrations: IDLH = 500 ppm LD_{50} = 350 mg/kg – oral, rat ingestion of 3 to 4 ml may be fatal Sensitive Receptors: ERPG-1 = 25 ppm ERPG-2 = 200 ppm ERPG-3 = 1,000 ppm

ACGIH	American Conference of Government Industrial Hygienists
ERPG	Emergency Response Planning Guideline
ERPG-1	Maximum airborne concentration below which nearly all individuals could be exposed for up to 1 hour without experiencing other than mild transient adverse health effects
ERPG-2	Maximum airborne concentration below which nearly all individuals could be exposed for up to 1 hour without developing irreversible or serious health effects
ERPG-3	Maximum airborne concentration below which nearly all individuals could be exposed for up to 1 hour without experiencing life-threatening health effects
IDLH	Immediately dangerous to life and health
LD_{50}	Dose lethal to 50 percent of those tested
LDLO	Lowest published lethal dose
mg/kg	Milligrams per kilogram
mg/m^3	Milligrams per cubic meter
NIOSH	National Institute of Occupational Safety and Health
PEL	Occupational Safety and Health Administration (OSHA) permissible exposure limit for 8-hr workday
ppm	parts per million
STEL	Short-term exposure limit, 15-min. exposure
TCLO	Lowest published toxic concentration
TLV	ACGIH threshold limit value for 8-hr workday
TWA	NIOSH time-weighted average for 8-hr workday

The aqueous ammonia supplier will be selected during the construction and commissioning phases of the project consistent with City procurement requirements. Aqueous ammonia suppliers in the area that may be considered are included in Table 8.12-7.

TABLE 8.12-7
Aqueous Ammonia Suppliers

Supplier	Shipping Location
Basic Chemical Solutions, LLC	Lathrop, CA
LA Chemical	San Jose, CA
Hill Brothers Chemicals Company	San Jose, CA

Aqueous ammonia will be delivered to the plant by truck transport. The truck loading area will be located within a bermed area adjacent to the storage tank. The floor of the loading area will be sloped to drain into the spill containment vault. The use of 29 percent aqueous ammonia will require approximately 14 deliveries of ammonia per year. The results of an Offsite Consequences Analysis presented in Subsection 8.12.5 show that release of a 29 percent solution of aqueous ammonia under a worst-case scenario will not cause significant offsite impacts to public health or safety.

In addition to the 29 percent solution of aqueous ammonia (10,000 gallons) that will be used onsite, other chemicals that will be stored at SFERP are sodium hypochlorite (400 gallons), sulfuric acid (400 gallons), and aluminum sulfate (800 gallons). These materials are additives used in the cooling tower or in the water treatment process. They are consumed in the process and produce no residual waste.

The sodium hypochlorite is a 10 to 12 percent solution, which is used in the process water treatment system and the cooling tower to control biological growth (algae). The sodium hypochlorite will be stored in a portable tote near the cooling tower and the water treatment building. It is expected that the bleach volume will provide 33 days of maximum continuous operation. Under a period of daily operation (rather than continuous), the preceding estimated days of chemical storage may double or be even longer. The sodium hypochlorite will be stored in a bermed area for secondary containment (an area capable of capturing any spills) that will be designed such that incompatible chemicals will be separated from each other to eliminate potential interactions/reactions in the event that the chemicals are accidentally released. It is estimated that the spill containment volume will be approximately 100 cubic feet.

The SFERP will use a 93 to 98 percent solution of sulfuric acid in the cooling tower to control water chemistry (i.e., pH). The SFERP facility will store sulfuric acid in a dedicated tote near the cooling tower and/or the water treatment building. It is expected that the sulfuric acid volume will provide 7 days of maximum continuous operation. Under a period of daily operation (rather than continuous), the preceding estimated days of chemical storage may double or be even longer. The sulfuric acid will be stored in a bermed area that will be designed such that incompatible chemicals will be stored separately to eliminate potential interactions/reactions in the event that the chemicals are accidentally released. It is estimated that the spill containment volume will be approximately 75 cubic feet.

The aluminum sulfate will be used by SFERP in the water treatment process to remove impurities from the process water and will be stored in two 400 gallon tanks. The tanks will be stored in a bermed area of the same design as described above.

If a chemical release were to occur without proper engineering controls in place, the public could be exposed to harmful vapors, and incompatible chemicals could mix, causing vapors that could also potentially have harmful effects. In addition, an uncontrolled release of liquid chemicals could run off and drain into the combined sewer system and potentially degrade water quality. However, the California Fire Code, Articles 79 and 80, includes specific requirements for the safe storage and handling of hazardous materials that would reduce the potential for a release of hazardous materials, and mixing of incompatible materials.

The design of the project will incorporate state-of-the-art chemical storage and handling facilities in compliance with the current California Fire Code and other applicable federal, state, and local regulations as discussed in Subsection 8.12.8.2.1. In addition, the chemicals will be stored outdoors in order to reduce exposure risks to workers. The facility may include some of the following onsite security measures to ensure that accidental releases will not occur: close circuit cameras; security personnel; and round the clock staffing.

As discussed in that section, the City will also be required to prepare an HMBP for the storage and handling of hazardous materials at the SFERP site. The plan will incorporate City emergency response procedures for hazardous materials incidents specified in the San Francisco Area Plan for Hazardous Materials Incidents. In accordance with the Aboveground Petroleum Storage Act, the aboveground petroleum storage will also be subject to the Act and an SPCC plan specifying methods to prevent and contain a spill will be prepared as discussed in Subsection 8.12.8.2.3.

During facility operations, potential hazards associated with contaminated soil and groundwater will be mitigated by compliance with the post-construction requirements of the RMP/SMP, including maintaining asphalt, concrete, or clean soil cover materials over site soil, establishing health and safety protocols to protect workers exposed to subsurface soil or groundwater, and preventing use of groundwater beneath the site. Additional information can be found in Subsection 8.13, Waste Management.

Because of its hazardous properties, aqueous ammonia is classified as a regulated substance, and an accidental release of the 29 percent aqueous ammonia could present the most likely potential for effects on the environment and/or human health of all the chemicals used at the site. Pure ammonia (NH_3) is a volatile, regulated substance that is very soluble in water. Aqueous ammonia consists of a solution of ammonia and water. If the aqueous ammonia solution were to leak or be released without proper controls, the ammonia in solution could escape or evaporate as a gas into the atmosphere.

Ammonia gas can be toxic to humans at sufficient concentrations. Potential toxic effects of ammonia and acceptable exposure levels are summarized in Table 8.12-6. The odor threshold of ammonia is about 5 ppm, and minor irritation of the nose and throat will occur at 30 to 50 ppm. Ammonia concentrations greater than 140 ppm will cause detectable effects on lung function even for short-term exposures (0.5 to 2 hours). At higher concentrations of 700 to 1,700 ppm, ammonia gas will cause severe effects; death occurs at concentrations of 2,500 to 6,000 ppm (Smyth, 1956).

Storage and use of ammonia would be subject to the requirements of the California Fire Code, Article 80, described in Subsection 8.12.8.2.1, as well as the CalARP, described in Subsection 8.12.8.2.2. Article 80 of the California Fire Code contains specific requirements for control of liquid and gaseous releases of hazardous materials. Secondary containment in the form of an underground spill containment vault, as described earlier in Subsection 8.12.4.2, will be provided for the ammonia storage tank and loading area. In addition, the facility will be required to prepare an RMP in accordance with the CalARP, further specifying safe handling procedures for the ammonia as well as emergency response procedures in the event of an accidental release.

Sulfuric acid is also identified as a regulated substance under the CalARP program, but only if it is concentrated with greater than 100 pounds of sulfur trioxide, if it meets the definition of oleum, or if it is stored in a container with flammable hydrocarbons. The sulfuric acid that will be used at the facility meets none of these criteria. Therefore, sulfuric acid is not subject to CalARP requirements.

With construction in accordance with applicable laws and regulations, provision of secondary containment for storage and loading facilities, preparation of a HMBP, preparation of a SPCC plan, and preparation of an RMP, discussed in Subsections 8.12.8.2.1 through 8.12.8.2.3, potential public health and environmental impacts related to the use of hazardous materials and regulated substances are mitigated to a less than significant level.

8.12.5 Offsite Migration Modeling

Because there is human activity in the vicinity of the proposed site, a vulnerability analysis was performed to assess the risk to humans from the site if a spill or rupture of the aqueous ammonia storage tank were to occur. Dispersion modeling was conducted using the SLAB numerical dispersion model (LLNL, 1990).

The worst-case accidental release scenario assumed the aqueous ammonia storage tank was punctured and the entire contents was spilled into a catch basin or bermed area located beneath the tank. An initial ammonia emission rate for an evaporating pool of 29 percent aqueous ammonia solution was calculated pursuant to the guidance given in *RMP Offsite Consequence Analysis Guidance, EPA, April 1999* and using the "evaporation calculator" provided by the National Oceanic and Atmospheric Administration (NOAA, 2002). Release rates for ammonia vapor from an evaporating 29-percent solution of aqueous ammonia were calculated assuming mass transfer of ammonia across the liquid surface occurs according to principles of heat transfer by natural convection. The ammonia release rate was calculated using the evaporation calculator, meteorological data listed below and the dimensions of the secondary containment area. The offsite consequence analysis is provided as Appendix 8.12A.

An initial ammonia evaporation rate was calculated and assumed to occur for at least one hour. For concentrated solutions, the initial evaporation rate is substantially higher than the rate averaged over time periods of a few minutes or more since the concentration of the solution immediately begins to decrease as evaporation begins. Parameters used to calculate the initial ammonia emission rate include an atmospheric stability classification of "F," a wind speed of 1.5 meters/second and a temperature of 97 degrees Fahrenheit (°F). Using these parameters, the ammonia plume was predicted to extend approximately 30.13 meters

(99 feet) at the height of 1.6 m from the ammonia storage tank at a concentration of 200 ppm. At a concentration of 75 ppm, the distance was 31.1 meters (102 feet) from the tank at the height of 1.6 m. The assumptions used in this analysis include the following:

- A total mass release of 3,413 pounds of ammonia is assumed to occur over 1 hour, representing an evaporating pool of 10,000 gallons of a 29 percent ammonia solution
- An ammonia storage temperature of 97 °F (highest temperature recorded at San Francisco International Airport [SFO] over the past 3 years)
- A diked area of 665 square feet (17.5 feet wide by 38 feet long)
- A roughness length of 0.4 meters, representing an urban, industrial area

Based on this conservative modeling analysis, the worst case accident is not expected to result in an offsite release greater than 5 ppm to the north, south, or east of the site. Thus, offsite concentrations in publicly accessible areas will be below 5 ppm. Offsite concentrations of greater than 2,000 ppm could occur to the west of the site approximately 35 feet onto the proposed MUNI Maintenance and Operations Center, which will not be accessible by the public. Since the general public will not be exposed to ammonia concentrations above 5 ppm during a worst-case release scenario, the storage of aqueous ammonia onsite will not pose a significant risk to the public. The Applicant will install ammonia sensors to activate audible alarms and flashing lights to alert MUNI and SFERP personnel should a spill occur. The applicant will also work with the MUNI Maintenance and Operations Center to determine other appropriate means of notifying MUNI staff should there be a release, and provide training on the proper response in the event of a spill including notification of hazardous response teams.

Table 8-12.8 identifies the extent of the gaseous ammonia concentrations to the west in the unlikely event of a catastrophic release.

TABLE 8.12-8
Gaseous Ammonia Concentrations to the West in the Event of a Release

Concentration (ppm)	Distance from Ammonia Tank to Plume Edge (feet)	Distance from SFERP Fenceline to Plume Edge (on proposed MUNI Maintenance and Operations Center) (feet)
2000 ppm (risk of lethality)	84.6	35.4
300 ppm (OSHA's IDLH)	97.5	48.0
200 ppm (EPA/CalARP toxic endpoint)	98.9	49.4
75 ppm (CEC Significance Value)	102.1	52.9
25 ppm (San Francisco Public Health Department)	111.2	61.6
5 ppm (Odor Threshold)	114.8	66.5

Notes:

The complete Offsite Consequence Analysis may be found in Appendix 8.12A.
Distances calculated based off the height of the average human (1.6 m).

8.12.6 Fire and Explosion Risk

Table 8.12-5 describes the flammability for the hazardous materials that will be onsite. With the exception of ammonia and lubricating oils, all hazardous materials are nonflammable. Article 80 of the California Fire Code requires all hazardous materials storage areas to be equipped with a fire extinguishing system and also requires ventilation for all enclosed hazardous material storage areas.

Aqueous ammonia, which constitutes the largest quantity of hazardous materials onsite (except for the oil contained in the equipment) and is the only chemical classified as a regulated substance, is incombustible in its liquid state. Under normal storage conditions, ammonia would not evaporate to the atmosphere because it would be contained within a totally enclosed system equipped with ventilation as required by Article 80 of the California Fire Code and described in Subsection 8.12.8.2.2. In the unlikely event that a release were to occur, ammonia could evaporate as a vapor. Ammonia vapor is combustible only within a narrow range of concentrations in air. The evaporation rate of aqueous ammonia is similar to water, which is sufficiently low that the lower explosion limit (LEL) of 15 percent (or 15,000 parts per million) will not be reached.

The lubrication oil is flammable. In accordance with Article 80 of the California Fire Code, the storage area for the lubrication oil would be equipped with a fire extinguishing system and the lubrication oil would be handled in accordance with an HMBP approved by the SFDPH and the CEC. With proper storage and handling of flammable materials in accordance with the California Fire Code and the site-specific HMBP, the risk of fire and explosion at the generating facility would be minimal.

The natural gas fuel the facility will use is flammable and could leak from the pipeline that brings the gas from the main PG&E distribution pipeline. Natural gas is composed mostly of methane, but also may contain ethane, propane, nitrogen, butane, isobutene, and isopentane. It is colorless, odorless, tasteless, and is lighter than air. Methane is flammable when mixed in air at concentrations of 5 to 14 percent, which is also the detonation range. Natural gas, therefore, poses a risk of fire and explosion if an accidental release were to occur. However, the risk of a fire and/or explosion would be reduced through compliance with applicable codes, regulations, and industry design/construction standards.

The federal safety and operating requirements for natural gas pipelines are contained in Title 49 of the Code of Federal Regulations, Parts 190 through 192. These requirements vary according to population density and land use; the pipeline classes are defined as follows:

- Class 1 includes pipelines in locations with 10 or fewer buildings intended for human occupancy.
- Class 2 includes pipelines in locations with more than 10, but fewer than 46 buildings intended for human occupancy.
- Class 3 includes pipelines in locations with more than 46 buildings intended for human occupancy, or where the pipeline is within 100 yards of any building or small well-defined outside area occupied by 20 or more people on at least 5 days per week for 10 weeks in any 12-month period.

- Class 4 includes pipelines in locations where buildings with 4 or more stories aboveground are prevalent.

The project's pipeline will be designed to meet Class 3 service and will meet California Public Utilities Commission General Order 112-D and 58-A standards, in addition to the federal requirements for gas pipeline construction and safety.

The closest San Francisco fire station is Station No. 25 at 3305 3rd Street. The station is approximately 0.5 mile away and would provide the first response to a fire at the project site. If hazardous materials were involved in the incident, the San Francisco Fire Department Hazardous Materials Team located in Station No. 36 at 109 Oak Street would also be called to respond. This station is located approximately 4 miles from the project site. In addition, the San Francisco Environmental Health Section of the Department of Public Health provides emergency responders that serve as technical consultants for the Fire Department's Hazardous Materials Team.

8.12.7 Cumulative Impacts

A cumulative impact of the use and storage of hazardous materials could occur if there were a simultaneous release of a chemical that could migrate offsite from two or more sites. Potentially, the two or more migrating releases could combine, thereby posing a greater threat to the offsite population than a single release from any single site. Ammonia is the only hazardous material that will be used during project operation that would be stored in sufficient quantity onsite to have the potential to cause such a cumulative impact.

As discussed in Subsection 8.12.5, an ammonia plume that could occur as a result of a catastrophic release from the ammonia tank would be expected to extend westward from the ammonia tank, just over the project fence onto the proposed MUNI Operations and Maintenance Center. A predicted plume concentration of 2,000 parts per million would extend approximately 35 feet onto the MUNI site from the SFERP's western fence line. The predicted plume concentration rapidly drops to 25 parts per million on the MUNI site at a distance of 62 feet from the SFERP western fence line.

To determine if other facilities have the potential to result in cumulative release of chemicals, the facilities that have filed an RMP with the SFDPH were identified and are summarized in Table 8.12-9. These facilities with completed RMPs would be considered to have the greatest potential to cause a cumulative impact in the event of a simultaneous release. As shown in Table 8.12-9, the identified facilities all handle ammonia and are located over 0.5 mile from the project site. Since most of these facilities are located more than 0.5 mile from the project site, in the event of a simultaneous release of ammonia from one of these facilities and from the SFERP project, the cumulative impacts are negligible. There is however one facility, the Potrero Power Plant (Potrero PP) which is located approximately 0.5 mile north of the project. The Potrero PP has completed a RMP, and the San Francisco Department of Public Health has deemed it complete, pending a public comment period. The Potrero PP RMP offsite consequence analysis was performed using the SFDPH guidance, which strongly encourages the use of EPA's RMP*Comp program. This program provides an conservative estimate of the offsite impacts to be used for planning purposes. The distance to the 200 ppm ammonia toxic endpoint modeled in the Potrero PP RMP is 0.9 miles, which would intersect the SFERP plume, if the three ammonia

storage tanks (two Potrero PP tanks and the SFERP ammonia tank) were to experience a catastrophic failure at the same time. The probability of this occurring is remote. Regardless, the combination of the Potrero PP ammonia plume with the SFERP plume would not impact residential receptors (the SFERP ammonia plume is confined to the project site and the adjacent MUNI site). Therefore, the cumulative impacts associated with a release of ammonia from the SFERP and Potrero PP are insignificant.

TABLE 8.12-9
Facilities in San Francisco That Have Filed a Risk Management Plan for Ammonia Use/Storage

Site Name	Address	Regulated Substance	Approximate Distance from Project Site, Miles
UCSF/CUP Containment Structure	2 Medical Center Way	Ammonia	6
C.J. Figone Cold Storage	420 17th Street	Ammonia	1.2
Dean's Services	1600 Donner Avenue	Ammonia	2.2
Growers Refrigeration, Inc.	2050 Galvez Avenue	Ammonia	1.3
Potrero PP (in progress)	1201 Illinois Street	Ammonia	0.5*

Sources: SFDPH, 2005
* The Potrero PP has filed an RMP with the San Francisco Department of Public Health and was deemed complete, pending public comment.

8.12.8 Proposed Mitigation Measures

The following subsections present measures included in the project to mitigate potential public health and environmental impacts of handling hazardous materials and regulated substances during construction and operation.

8.12.8.1 Construction Phase

As discussed in Subsection 8.12.4, the hazardous materials that would be used during construction present a relatively low public health risk, but could contaminate surface water or groundwater if a release occurred. Registering these hazardous materials in accordance with Article 21 of the San Francisco Health Code and use of best management practices would reduce the potential for the release of construction-related fuels and other hazardous materials to stormwater and receiving waters as discussed in Subsection 8.14, Water Resources. Best management practices prevent sediment and stormwater contamination from spills or leaks, control the amount of runoff from the site, and require proper disposal or recycling of hazardous materials.

Service personnel will follow general industry health, safety, and environmental standards for filling and servicing construction equipment and vehicles. The standards are designed to reduce the potential for incidents involving the hazardous materials. They include the following:

- Refueling and maintenance of vehicles and equipment will occur only in designated areas that are either bermed or covered with concrete or asphalt to control potential spills. Employees will be present during refueling activities.
- Vehicle and equipment service and maintenance will be conducted only by authorized personnel.
- Refueling will be conducted only with approved pumps, hoses, and nozzles.

- Catch-pans will be placed under equipment to catch potential spills during servicing.
- All disconnected hoses will be placed in containers to collect residual fuel from the hose.
- Vehicle engines will be shut down during refueling.
- No smoking, open flames, or welding will be allowed in refueling or service areas.
- Refueling will be performed away from bodies of water to prevent contamination of water in the event of a leak or spill.
- When refueling is completed, the service truck will leave the project site.
- Service trucks will be provided with fire extinguishers and spill containment equipment, such as absorbents.
- Should a spill contaminate soil, the soil will be put in containers and disposed of as appropriate. All containers used to store hazardous materials will be inspected at least once per week for signs of leaking or failure. All maintenance and refueling areas will be inspected monthly. Results of inspections will be recorded in a logbook that will be maintained onsite.

In the unlikely event of a spill, the spill may need to be reported to the appropriate regulatory agencies and cleanup of contaminated soil could be required. Small spills will be contained and cleaned up immediately by trained, onsite personnel. Larger spills will be reported via emergency phone numbers to obtain help from offsite containment and cleanup crews. All personnel working on the project during the construction phase will be trained in handling hazardous materials and the dangers associated with hazardous materials. An onsite health and safety person will be designated to implement health and safety guidelines and to contact emergency response personnel and the local hospital, if necessary.

If there is a large spill from a service or refueling truck, contaminated soil will be placed into barrels or trucks by service personnel for offsite disposal at an appropriate facility in accordance with law. If a spill involves hazardous materials equal to or greater than the specific reportable quantity (25 gallons for petroleum products), all federal, state, and local reporting requirements will be followed. In the event of a fire or injury, the local fire department will be called (City of San Francisco Station No. 25).

8.12.8.2 Operation Phase

During facility operation, various hazardous materials and one regulated substance will be stored onsite as shown in Table 8.12-3 as shown in Table 8.12-3. Table 8.12-4 presents information about these materials, including trade names, chemical names, Chemical Abstract Service (CAS) numbers, maximum quantities onsite, RQs, CalARP TPQs, and status as a Proposition 65 chemical (a chemical known to be carcinogenic or cause reproductive problems in humans). Health hazards and flammability data are summarized for these materials in Table 8.12-5, which also contains information on incompatible chemicals (e.g., sodium hypochlorite and ammonia). Table 8.12-6 describes the toxicity of the regulated substance and hazardous materials. Listed below are mitigation measures for minimizing the public health risks associated with hazardous material and regulated substance handling during facility operation.

8.12.8.2.1 Hazardous Materials. All hazardous materials will be handled and stored in accordance with applicable codes and regulations specified in Subsection 8.12.2. Specific requirements of the California Fire Code that reduce the risk of fire or the potential for a release of hazardous materials that could affect public health or the environment include:

- Provision of an automatic sprinkler system for indoor hazardous material storage areas.
- Provision of an exhaust system for indoor hazardous material storage areas.
- Separation of incompatible materials by isolating them from each other with a noncombustible partition.
- Spill control in all storage, handling, and dispensing areas.
- Separate secondary containment for each chemical storage system. The secondary containment is required to hold the entire contents of the tank plus the volume of water for the fire suppression system that could be used for fire protection for a period of 20 minutes in the event of a catastrophic spill.

In addition, an HMBP is required by CCR Title 19 and the Health and Safety Code (Section 25504) as well as Article 21 of the San Francisco Health Code, which incorporates state requirements for hazardous materials handling and specifies some more stringent requirements. In accordance with these regulations, the HMBP will include an inventory and location map of hazardous materials onsite and an emergency response plan for hazardous materials incidents. Specific topics to be covered in the plan include:

- Facility identification
- Emergency contacts
- Chemical inventory information (for every hazardous material)
- Site map
- Emergency notification data
- Procedures to control actual or threatened releases
- Emergency response procedures
- Training procedures
- Certification

The HMBP will be filed with the SFDPH and updated annually in accordance with applicable regulations. The SFDPH will ensure review by and distribution to other potentially affected agencies including the San Francisco Fire Department.

In accordance with emergency response procedures specified in the HMBP, designated personnel will be trained as members of a plant hazardous material response team, and team members will receive the first responder and hazardous material technical training to be developed in the HMBP, including training in appropriate methods to mitigate and control accidental spills. However, in the event of a chemical emergency, plant personnel will defer to the San Francisco Hazardous Materials Team at San Francisco Fire Station No. 36 (109 Oak Street), approximately 4 miles away.

8.12.8.2.2 Aqueous Ammonia. Aqueous ammonia will be used in a selective catalytic reduction (SCR) process to control NO_x emissions created in the combustion chambers of the

combustion turbines. The SCR system will include a reactor chamber, catalyst modules, an ammonia storage system, and an ammonia injection system. The aqueous ammonia, stored as a liquid solution of 29 percent ammonia and 71 percent water, will be injected into the reactor chamber. The rate of injection will be controlled by a monitoring system that uses sensors to determine the correct quantity of ammonia to feed to the reactor chamber. The reactor chamber will contain the catalyst modules and be located where the catalyst will be most effective at the desired levels of plant operation.

Approximately once every 9 days during full operation (or a maximum of 14 deliveries per year), one 6,500-gallon tanker truck will deliver aqueous ammonia to the site. The ammonia will be stored in an aboveground stationary tank with a 12,000-gallon capacity with the maximum quantity onsite will not exceed approximately 10,000 gallons, contained within a secondary containment system, as required by the Uniform Fire Code. This containment system includes a concrete containment area surrounding the tank. The containment area will have a sloped floor, which will direct any liquid to a 24-inch drain centered below the tank. This drain will lead to a covered sump. The aqueous ammonia storage tank will be equipped with continuous tank level monitors, automated leak detection system, temperature and pressure monitors and alarms, and excess flow and emergency block valves.

Ammonia is a regulated substance under the federal Clean Air Act pursuant to 40 CFR 68 (Subpart G) and the CalARP pursuant to Health and Safety Code Sections 25331 through 25543.3. The California program is similar to the federal program but is more stringent in some areas.

In accordance with CalARP regulations, a RMP will be required in addition to the HMBP described above. The document, " Local Guidance Document for Preparation of a Risk Management Plan (RMP)" will be obtained from the San Francisco Department of Public Health will be used to prepare the RMP. The RMP includes a hazard assessment to evaluate the potential effects of an accidental release, a program for preventing an accidental release, and a program for responding to an accidental release. The specific components of an RMP include:

- Description of the facility
- Accident history of the facility
- History of equipment used at the facility
- Design and operation of the facility
- Site map(s) of the facility
- Piping and instrument diagrams of the facility
- Seismic analysis
- Hazard and operability study
- Prevention program
- Consequence analysis
- Offsite consequence analysis
- Emergency response
- Auditing and inspection
- Record keeping
- Training
- Certification

The RMP is prepared interactively with the SFDPH and the public is provided with an opportunity for review and input to the plan as part of the public hearing/notification requirements of Article 21A of the San Francisco Health Code. The RMP will be filed with and administered by the SFDPH. This department will ensure review by and distribution to other potentially affected agencies including the San Francisco Fire Department and Bay Area Air Quality Management District.

A Process Safety Management Plan (PSM) will not be required under OSHA, because the OSHA regulations apply only to aqueous ammonia solutions above 44 percent (29 CFR Part 199). The requirements for a PSM are very similar to those for an RMP although an offsite consequences analysis is not required for the PSM. The RMP may be sufficient to also meet the requirements of a PSM plan, if required.

8.12.8.2.3 Petroleum Products. Federal and California regulations require a SPCC plan if petroleum products above certain quantities are stored. Both federal and state laws apply only to petroleum products that might be discharged to navigable waters. If stored quantities are equal to or greater than 660 gallons for a single container, or equal to or greater than 1,320 gallons total (including ASTs, oil-filled equipment, and drums), an SPCC must be prepared. Since the facility will store more than 1,320 gallons of petroleum products, an SPCC plan will be prepared.

8.12.8.2.4 Transportation/Delivery of Hazardous Materials and Regulated Substances. Hazardous materials and one regulated substance will be delivered periodically to the facility. As discussed in Subsection 8.10, Traffic and Transportation, transportation of hazardous materials will comply with all Department of Transportation (Caltrans), USEPA, California Department of Toxic Substances Control (DTSC), CHP, and California State Fire Marshal regulations. Under the California Vehicle Code, the CHP has the authority to adopt regulations for transporting hazardous materials in California. The CHP can issue permits and specify the route for hazardous material delivery. Aqueous ammonia, the only regulated substance that will be delivered to the facility, will be transported in accordance with Vehicle Code Section 32100.5, which regulates the transportation of hazardous materials that pose an inhalation hazard. In addition, ammonia will only be transported along approved transportation routes. The approved route would be from Interstate 280 to Cesar Chavez Street, to Illinois Street, to 25th Street, to the project site.

8.12.8.2.5 Security Plan. In addition to standard industrial business security measures, the City will be preparing a security plan that will include the following elements:

- Descriptions of the site fencing and security gate
- Evacuation procedures
- A protocol for contacting law enforcement in the event of conduct endangering the facility, its employees, its contractors, or public
- A fire alarm monitoring system
- Measures to conduct site personnel background checks, including employee and routine on-site contractors consistent with state and federal law regarding security and privacy
- A site access protocol for vendors

- A protocol for Hazardous Materials vendors to prepare and implement security plans as per 49 CFR 172.800 and to ensure that all hazardous materials drivers are in compliance with personnel background security checks as per 49 CFR Part 172, Subpart I

The plan will also include a demonstration that the perimeter security measures will be adequate. The demonstration may include one or more of the following:

- security guards
- security alarm for critical structures
- perimeter breach detectors and on-site motion detectors
- video or still camera monitoring system

8.12.8.3 Monitoring

In accordance with applicable federal, state, and local regulations, site personnel would regularly inspect all hazardous materials handling facilities for compliance with applicable regulations and would ensure that any deficiencies were promptly repaired. In addition, the facility would be subject to regular inspections by the SFDPH and San Francisco Fire Department, which would ensure compliance with appropriate regulatory requirements for hazardous materials and regulated substances handling.

8.12.9 Involved Agencies and Agency Contacts

Several agencies regulate hazardous materials and they will be involved in regulating the hazardous materials stored and used at the facility. At the federal level, the USEPA will be involved; at the state level, the California Environmental Protection Agency (CalEPA) will be involved. However, local agencies are primarily responsible for enforcing hazardous materials laws. For the project, the local agencies involved will be the SFDPH and San Francisco Fire Department, Fire Prevention Bureau. The persons to contact are shown in Table 8.12-10.

TABLE 8.12-10
Agency Contacts

Type Material	Agency	Contact	Title	Telephone
Storage of Hazardous Materials and Regulated Substances	San Francisco Department of Public Health	Sue Cone	Program Manager	(415) 252-3991
Storage of Hazardous Materials and Regulated Substances	San Francisco Fire Department	Mary Boucher	Fire Inspector	(415) 558-3306
Hazardous Materials Response	San Francisco Fire Department, Station 36	Battalion Chief Burke	Acting Battalion Chief	(415) 558-3236

8.12.10 Permits Required and Permit Schedule

The SFDPH will require an HMBP for the storage of hazardous materials during construction and operation as well as an RMP for the storage of regulated substances. In addition, the San Francisco Fire Department could require the following permits related to construction of the chemical handling facilities and hazardous materials use during operation:

- **Building Permit.** This permit is required for construction of the aboveground storage tanks.
- **Fire Permit.** This permit is required for installation of the aboveground storage tanks.
- **Hazardous Materials Use and Storage Permit.** This permit is required for the use of hazardous materials during operation.

8.12.11 References

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